#MUZZLETHEBITE

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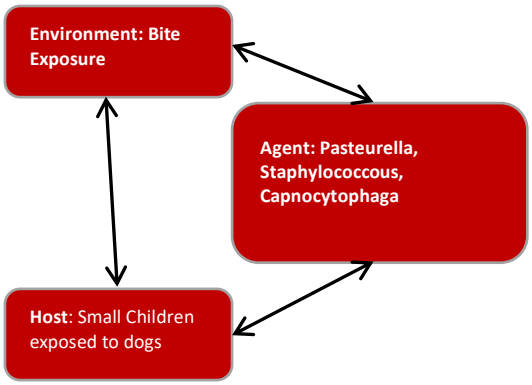
Background Info

Wound care is an important part of mitigating the effects of dog bite in young children. As many of the bacteria in dog bites are highly infectious, current knowledge of how to best handle these wounds is essential for helping manage the spread of this disease. A randomized controlled trial found that primary closure was the preferred methodology for am marginally improved infection rate, and significantly improved cosmetic outcome – essential in children in which self-appearance and self-confidence are being developed. Furthermore, injuries treated within 8 hours of the dog bite incident demonstrated a markedly improved infection rate over injuries treated over 8 hours; this highlights a public health need to highlight the importance of timely medical care for dog bite injuries in part of our outreach efforts to the public.

Dog Bite Epidemiological Triangle

Infections frequently spread through dog bites frequently include include Pasteurella spp, Staphylococcus, Streptococcus Capnocytophaga canimorsus (MedScape, 2011). Children under the age of 10 are frequently bit by dogs (the most common childhood accidental injury). Bite exposure comprises the single largest environmental factor that public health outreach efforts (Prabhakara, 2010). Understanding the interplay of the three parts of the Epidemiological triangle better allows us to manage the effects of dog bites and rabies infections.



Infection

	Infection in <8 h	Infection in >8 h	Infection total (%)
Young adults (16–39)	3/63 (4.7%)	3/18 (16.7%)	6/81 (7.4%)
Middle age adults (40–65)	2/45 (4.4%)	3/10 (30.0%)	5/55 (9.1%)
Senior adults (>65)	1/24 (4.2%)	2/8 (25.0%)	3/32 (9.3%)
Total	6/132 (4.5%)	8/36 (22.2%)	14/168 (8.3%)
Primary suturing	4/65 (6.1%)	4/17 (23.5%)	8/82 (9.7%)
Non-suturing	2/67 (2.9%)	4/19 (21.0%)	6/86 (6.9%)
	$p = 0.43$	$p = 1.0$	$p = 0.51$
Total	*6/132 (4.5%)*	*8/36 (22.2%)*	*$p = 0.0025$*

Above: Table describing infection rates in wounds distributed by age and by whether wound received primary closure or non-closure.

Notably, there is a significant reduction in infection rate for wounds that are treated by any means within the first eight hours after the dog bite event – dropping the infection rate from over twenty-two percent to under five percent. This difference is essential in helping limit the damaging effects of rabies in individuals.

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Purpose	This study intended to better understand the effects of primary closure vs non closure and age in simple cutaneous dog bite injuries as a method of reducing the rate of infection. Infection bacteria was not explicitly cultured or defined as a part of this study, since dog bite infections are typically polymicrobial, but most frequently involve Pasteurella spp (MedScape, 2011). Further, aesthetics of wound repair comparing the two interventions was measured. Particularly in young age groups, personal appearance and self-confidence can pose a secondary public health issue.
Toxicology	While not explicitly defined in this study, the most frequent toxin in dog bites is Pasteurella spp. (MedScape, 2011). Pasteurella spp is most commonly associated with cat and dog bites and is associated with 50% of dog bites and 75% of cat bites seen in the close to 300,000 yearly emergency room visits for animal bites. (Körmöndi, et. al., 2019; Wilson & Ho, 2013). Infection typically begins with cutaneous spread, and begin with localized infection with cutaneous inflammation; more severe cases can involved osteomyelitis, septic arthristis, abscess formation, or systemic infection of large articulated joints, intraabdominal infection, sepis or pneumonia (Körmöndi, et. al., 2019).
Methodology	200 consecutive patients presented between 2009 and 2012 to an emergency room for treatment secondary to a dog bite. Power analysis determined 124 patients would be sufficient for cosmetic analysis at 95% power, at 0.05 level with 1.30 difference. Patients were included if presented within 48 hours of injury for treatment, with full thickness injury, and if older than 6 years of age. Complex injuries and antibiotic allergies were considered exclusionary factors. Patients were assigned to receive primary closure or non-closure, at random, by a computer based system.
Critique	The main criticism in this study was the lack of a larger sample size, as well as not including patients under the age of 16. While controlled trials involving children are or difficult and one typically would want to “play it safe” in this population when performing research, children under the age of ten are the most commonly affected by dog and other animal bites, and addressing this in this study would have been preferred.
Conclusion	This study provided a clear overview of the use of medical management techniques for helping limit the spread of infection temporally, by age, and by surgical intervention. Understanding these risk factors more comprehensively allows public health experts to better tailor preventative measures to limit the incidence of dog and animal bite cases. Additional preventative measures will help reduce healthcare system burden, as well as provide for safer communities.

References

Körmöndi, S., Terhes, G., Pál, Z., Varga, E., Harmati, M., Buzás, K....Urbán, E. (2019). Human Pasteurellosis Health Risk for Elderly Persons Living with Companion Animals. Emerging Infectious Diseases, 25(2), 229-235. https://dx.doi.org/10.3201/eid2502.180641.
MedScape. “Animal Bite-Associated Infections.” Medscape, 11 Apr. 2011, www.medscape.com/viewarticle/739023_4.

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Prabhakara, G. (2010). *Short textbook of preventive and social medicine*. Bengaluru St. Louis (USA: Jaypee Brothers Medical Publishers.

Wilson, B. A., & Ho, M. (2013). Pasteurella multocida: from Zoonosis to Cellular Microbiology. Clinical Microbiology Reviews, 26(3), 631–655. doi:10.1128/cmr.00024-13